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## INFORMATION REPORT INFORMATION REPORT

### CENTRAL INTELLIGENCE AGENCY

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50X1-HUM

COUNTRY USSR

REPORT

SUBJECT Highway and Tunnel Construction  
Projects in the USSR

DATE DISTR.

3 May 1960

NO. PAGES

2

REFERENCES

50X1-HUM

DATE OF  
INFO.PLACE &  
DATE ACQ.

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four reports described below, concerning highway and tunnel construction projects in the USSR

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#### Construction of the Kuybyshev-Mukhanovo Highway (attachment 1)

This report deals mainly with the four-kilometer-long stretch of road between Mukhanovo and the Kinel River (which was to have been completed by 1957), and the bridge over the Kinel River. The report discusses technical details such as materials going into the foundation of the highway and methods of driving the piles for the bridge during the winter months. Information on the work force employed on the project, their salaries, and machinery used is also included.

#### Railroad Tunnel in Novyy Afon (attachment 2)

Details are given concerning construction of a railroad tunnel in Novyy Afon, which would not run as near the coast as the old line and would shorten the route to Tbilisi. A 1/100 scale sketch of the tunnel is included in the report. As of July 1949, the line was not yet in use since a ravine on the Tbilisi side had yet to be filled in and the old line had not yet been linked to the tunnel tracks. the new line would be used for communications with the coastal cities and that the old line would be discarded.

#### The Velikiye Luki-Riga Highway Construction Project (attachment 3)

Information is included on traffic, bridges, and terrain encountered on the 250 kilometer stretch of road which had been completed on this third-category, two-lane highway as of October 1956 and which had reached Krasnogorodskoye. Also included are particulars on team construction work to repair damage caused by holes and cracks in the roadbed on many stretches between Nasva and Krasnogorodskoye. Mention is made of the construction personnel employed on this project and their salaries.

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Construction of the Khimki-Spas Highway (attachment 4)

A physical description of this third-category, eight-kilometer stretch of road, its terrain and traffic, is given. Information is offered on the continuous construction method used, the construction crew, monthly salaries, and construction equipment.

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Attachment 1

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COUNTRY USSR (Kuybyshev Oblast)

REPORT

SUBJECT Construction of the Kuybyshev-Mukhanovo Highway

DATE DISTR.

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CONSTRUCTION OF THE KUYBYSHEV-MUKHANOVO HIGHWAY

1. Construction work on the 120-kilometer-long highway between Kuybyshev and Mukhanovo (N 53-22, E 51-21), officially known as the Kuybyshev-Mukhanovo highway, was begun in June 1954; this project was included in the 1951-1956 Plan but was about three months behind schedule and probably would be finished in 1957. It was a two-way highway, was classified as a second category road, and had no numerical designation. It was 11 meters wide and consisted of a single seven-meter-wide lane with two-meter-wide shoulders on either side. The highway crossed the Kinel River about four kilometers from Mukhanovo and then continued parallel to the right bank of the river as far as Kuybyshev. the four-kilometer-long stretch of road between Mukhanovo and the Kinel River, and the information set forth below deals mainly with the construction of this section of the road and the bridge over the Kinel River. 50X1-HUM
2. Since there were no quarries or sand pits near the highway, round stones were obtained from the Kinel River and sand, clay, and mixed gravel obtained from the nearest available point and shipped by rail from Kuybyshev; the pipes and structural framework for the bridge also came from Kuybyshev. The foundation was composed of round stone, gravel, clay and sand; the roadbed was formed of two 3.5-centimeter-thick layers composed of 75 percent gravel, bitumen and powdered limestone, in order to prevent softening of the asphalt in hot weather. The highway had no tunnels. The maximum grade on the finished stretch was five percent, the minimum radius for curves was 250 meters, and banking on curves was normally about seven percent. The construction crew worked in groups: one group installed the water conduits; another prepared the ballast-bed; the third laid the foundation; the fourth surfaced the road with asphalt, and the fifth put up traffic signals and repaired defects in the roadbed. The crew was required to complete two hundred meters of highway each day.
3. The bridge built over the Kinel River was 108 meters long, nine meters wide, and 13 meters above the surface of the water. The piles, which formed the foundation for the concrete piers supporting the metal structure, were driven during the winter months when the river was frozen over. Twenty-eight piles, made of metal pipe 30 centimeters in diameter and filled with concrete, were used for each pier (number of piers not specified); they were inserted through holes cut through 1.1-meter-thick ice and driven into place by pile drivers; three pile drivers were used; they were mounted on timbers with steel cross sections on wheels so that the machines could be moved over the ice. The piers were set into concrete during the summer: during the concreting process, two concentric circles of tongue and groove stakes with clay between them were used to keep the water away from the pier. It was planned to make the roadbed for the bridge of prefabricated reinforced concrete slabs but, as of September 1955, work on the roadbed had not yet begun. 50X1-HUM

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4. [redacted] the bridge and highway could not withstand a vehicle heavier than 15 tons. [redacted] 50X1-HUM

5. The number of men employed on this project was [redacted] 50X1-HUM  
 [redacted] adequate. The construction crew numbered 100; most of the men had been discharged from the army with the stipulation that they work on this highway construction project for a period of time equal to the remainder of their military service; [redacted] 50X1-HUM  
 [redacted] the personnel belonged to the MVD. The 50X1-HUM  
 construction crew included two engineers, five technicians, eight carpenters, nine pile driver operators, seven concrete workers, five men assigned to assemble the metal structure, some 20 truck drivers and their helpers, besides the operators of the bulldozers, graders, scrapers and road rollers, and other laborers. The machinery consisted of three bulldozers; two scrapers; three graders; two ten-metric-ton and two five-metric-ton road rollers; one asphalt spreader; approximately 30 dump trucks of two and a half, three and a half, and five-ton capacity; two .75, one .25 and one .5 cubic meter excavators; three Diesel-driven pile drivers; autogenous and electric welding equipment, and other auxiliary apparatus.

6. The monthly salaries were as follows:

chief engineer	- 3,000 rubles, plus bonuses for fulfilling the plan
engineer	- 1,500 rubles, plus bonuses for fulfilling the plan
technicians	- 1,088 rubles, plus bonuses for fulfilling the plan
truck drivers	- 1,700 rubles (for a 12-hour day)
bulldozer, grader and scraper operators	- 1,200 rubles
carpenters and employees assigned to assemble metal structures	- 800 rubles
laborers	- 600 rubles
auxiliary personnel (checking trucks, etc.)	- 450 rubles

Due to the fact that the construction site was far from Moscow, the Ministry of the Petroleum Industry augmented the above wages by a sum equal to 20 percent of the salaries listed above. 50X1-HUM

7. The Kuybyshev-Mukhanovo Highway construction project was supervised by the Chief of Construction Directorate No. 3; [redacted] 50X1-HUM  
 [redacted] He had the rank of polkovnik in the MVD and wore a khaki-colored uniform with gold shoulder boards, two large five-pointed stars, and a blue cap with red trimming. He was listed on the office payroll as a construction engineer and, [redacted] 50X1-HUM  
 [redacted] received additional pay because he was a military man.

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COUNTRY: USSR (Abkhazskaya ASSR)  
SUBJECT: Railroad Tunnel in Novyy Afon

REPORT

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1. The city of Novyy Afon, which was newly built, was located in the Abkhazskaya ASSR, about 40 kilometers northwest of Sukhumi (N 43-00, E 41-02) and about 30 kilometers from Gudauta (N 43-06, E 40-38). It had a port too small for medium-tonnage ships.

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There were no industrial plants in the city.

2. In January 1949, a railroad tunnel was under construction. The tracks would not run as near the coast as the old line and thus shortened the route to Tbilisi. The tunnel measured about six kilometers long by 12 meters wide by about seven meters high. The semi-circular roof was made of reinforced concrete faced (sic) with iron plate about four centimeters thick, fastened in place with thick bolts about four centimeters in diameter, that projected about three centimeters from the plate. The tunnel walls were cement to a height of two meters, where the iron plates began. Each side of the tunnel had a cement sidewalk about one and one-half meters wide. There were recesses in the walls about every 25 meters which measured about 2.5 meters wide, 1.5 meters deep, and three meters high. Source did not know their purpose. It was impossible for vehicles to pass through the tunnel. See sketch of tunnel on page 3.
3. Six or seven railroad cars of cement arrived daily at the railroad station which was located in a two-story brick building in the center of the city. Part of this cement was used in the construction of the tunnel.
4. Work on the tunnel was done in three eight-hour shifts. Excavation was begun at the same time on both sides of the mountain, and the two shafts were

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[REDACTED]  
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[REDACTED]

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joined in mid-June 1949. About 33 persons per shift worked on each end of the tunnel. No military personnel were employed. The double-track, standard gauge railroad was built after the tunnel was completed. [REDACTED]

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[REDACTED] in mid-July 1949, trains were not yet using the line because a ravine on the Tbilisi side of the tunnel had to be filled in and the old line had not yet been linked to the tunnel tracks.

5. [REDACTED] the new line would be used for communications with the coastal cities and that the old line would be completely unused. [REDACTED]

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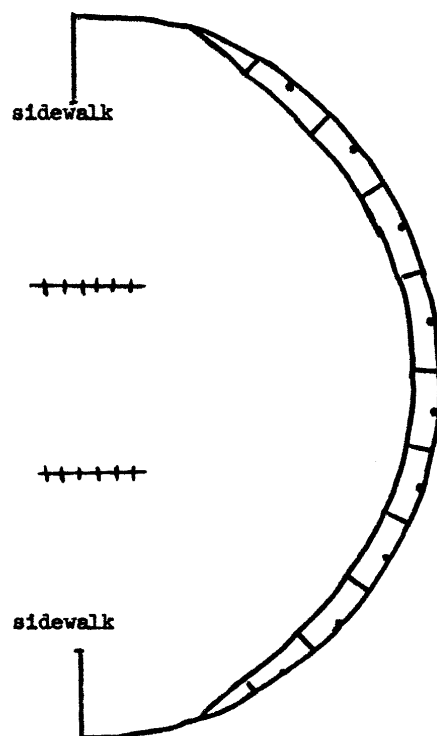
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Railroad Tunnel in City of Novyy Afon

Approximate scale: 1/100



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**COUNTRY** USSR (Velikolukskaya Oblast)**REPORT****SUBJECT** The Velikiye Luki-Riga Highway  
Construction Project**DATE DISTR.****NO. PAGES**

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**REFERENCES**

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## THE VELIKIYE LUKI-RIGA HIGHWAY CONSTRUCTION PROJECT

1. Construction work on the Velikiye Luki-Riga highway was begun in 1954; this project was included in the 1951-1956 Plan but the construction was at least six months behind schedule

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A 250-kilometer stretch of road had been completed and, as of October 1956, the construction had reached Krasnogorodskoye (see overlay of map of the Gulf of Riga, WAC (153), on page 4). The road had no numerical designation and was classified administratively as a third category highway. The Regional Highway Construction Office No. 6 (DSR No. 6) was in charge of laying the foundation and the roadbed and the Regional Road Exploitation Office took charge of surfacing the road, installing kilometer markers and traffic signs.

2. The highway was ten meters wide and consisted of a six-meter-wide center lane with two-meter-wide shoulders on either side; it had two-way traffic and could be used by all vehicles not exceeding ten tons. Tractors did not drive on the highway, and truck transport consisted mainly of harvested crops; one bus line provided passenger service between Velikiye Luki and Novosokolniki. The minimum radius for curves was 60 meters, banking on curves was normally about four percent, and the maximum grade in the completed stretch was a seven percent grade at the point of exit from Velikiye Luki; the rest of the road was almost flat, the maximum grade being not more than three percent. The finished stretch between Velikiye Luki and Nasva included two grade crossings - one at the entrance to Nasva and the other just after leaving Novosokolniki - and two seven-meter-wide bridges; one was a metal bridge (other details not known) erected about four kilometers from Velikiye Luki and the other, some 40 kilometers from the latter city, was a 15-meter-long, single span, reinforced concrete structure some eight meters above the surface of the water.

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3. The highway passed mainly through an agricultural area, and no industrial plants, therefore, were located along the route; between Velikiye Luki and Nasva, the highway crossed a river as well as some smaller bodies of water. The terrain was level as far as Nasva and the clayey soil in this area was suitable for this type of construction; from Nasva to Krasnogorodskoye, however, the terrain was swampy and difficulties were encountered. In snowy areas, it was common practice in the USSR to elevate highways which traversed flat ground and, in accordance with Soviet road building techniques, the Velikiye Luki-Riga highway was elevated between 60 and 100 centimeters. Despite this, there were many stretches between Nasva and Krasnogorodskoye where the water caused holes and cracks in the roadbed, even before the road was opened. It was necessary to tear up portions of the road and to construct drainage systems, replace the clayey soil with soil more resistant to water, replace the gravel in the foundation with limestone, and re-surface the road with cold asphalt. There was an abundance of round stone in the area and quarries, as well as sand pits, were opened up as near the highway as possible in order to save on transportation cost; limestone, however, had to be shipped by rail from Nevel to Novosokolniki and thence by truck to the construction site. In accordance with usual construction practices, the work was done by teams: the first team constructed bridges and installed water conduits; the second prepared the ballast bed, and the third laid the foundation and the first layer of the roadbed. The foundation consisted of a 15-centimeter-thick layer of sand and an 18-centimeter-thick layer of gravel; for the roadbed, a mixture of gravel,

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sand and tar was heated to a temperature of 60 degrees Centigrade until it turned a uniform dark brown color, whereafter it was laid to a thickness of seven centimeters. The Regional Road Exploitation Office, which had charge of the work from this point on, surfaced the road in the following manner: the roadbed was first covered with a layer of tar, followed by a layer of crushed limestone not more than three centimeters thick, then a second layer of tar, topped by a layer of crushed limestone not exceeding one centimeter in thickness. The road was then considered ready for use.

4. No prison labor or military personnel were employed on this project. The construction crew numbered about 80; most of them were new and inexperienced in this type of construction and, therefore, not very efficient. They included two bridge and highway construction engineers, some four technicians, two mechanics, 30 truck drivers, the bulldozer, scraper, grader and excavator operators and common laborers.

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the labor force was inadequate, and half again as many men should have been employed to keep the work up to schedule; the crew was supposed to complete a 750-meter stretch of road each day but actually averaged only 350 meters. The machinery included six bulldozers, three scrapers, five graders, three excavators, two ten-ton and two five-ton road rollers, two trucks for spreading bitumen, and about 30 dump trucks of two and 3.5-ton capacity. Highway maintenance was in charge of Road Exploitation Office No. 2 in Velikiye Luki; the maintenance crew consisted of three technicians and some 30 laborers. Traffic signs were similar to those used in other countries. Square, 90-centimeter high concrete piles, painted white, were used on curves to indicate the edge of the road. One service station existed in Velikiye Luki and another in Novosokolniki, but there were none along the completed stretch of highway. The highway was not guarded.

5. Construction personnel received the following monthly salaries: the chief engineers and engineers, 2,500 and 1,300 rubles, respectively, plus bonuses for fulfilling the plan; the technicians, between 780 and 700 rubles, plus a bonus for fulfilling the plan; the truck drivers, 1,200 rubles; the bulldozer, grader, scraper and excavator operators, 800 rubles; the mechanics, between 800 and 700 rubles, and the laborers, between 450 and 500 rubles.

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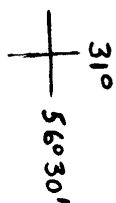
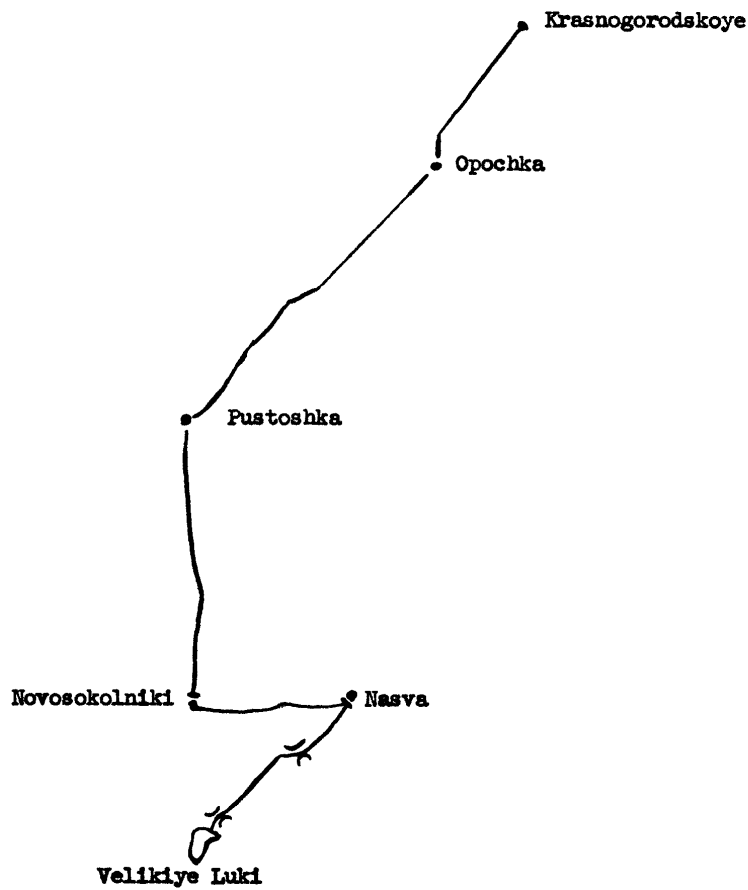
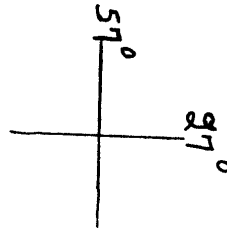
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Overlay of map of Gulf of Riga

Scale 1:1,000,000

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COUNTRY: USSR (Moscow Oblast)

REPORT

SUBJECT: Construction of the Khimki-Spas Highway

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DATE OF REPORT: 15 February 1960  
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1. The Khimki-Spas highway, an eight-kilometer-long stretch of road extending from Khimki to Spas (N 55-55, E 37-24), connected the Leningrad and the Volokolamsk highways; it was built to prevent traffic congestion in the center of Moscow. It was a third category, eight-meter-wide highway, consisting of a center lane six meters wide with one-meter-wide shoulders on either side; it could withstand five-metric-ton vehicles. Tractors were not permitted on the road and the shoulders were intended solely for pedestrian use. The terrain was slightly undulating and the road crossed over only one brook (name not recalled); there were no bridges, tunnels, fords, dikes, or dams along the route. The road was elevated between 60 and 120 percent, the maximum grade was between five and six percent, the minimum radius on curves was 150 meters, and the usual banking was from three to four percent. Traffic was light: truck traffic consisted mainly of three and four-metric-ton trucks loaded with construction materials (gravel and sand) for Moscow and its environs; one bus line provided passenger service between Khimki and Spas. Traffic was heavier during the summer than in the winter and, during heavy snowfalls, the road was impassable for several days at a stretch; however, no traffic bottlenecks occurred, since vehicles proceeding along either the Leningrad or the Volokolamsk highways and which normally would have used this cutoff, simply took the longer route through Moscow.
2. Sandpits located midway between Khimki and Spas provided sand and gravel; asphalt was obtained from Moscow, bitumen from Lyubertsy, and granite (for gravel) from

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Kiev. The continuous construction method was used, i.e., the ballast box, the sand and grading layer, a deep coating of asphalt, and then an agglomerate of hot asphalt. The roadbed was between 42 and 45 centimeters thick and was composed of three layers: first, a 20 to 22-centimeter-thick layer of sand, followed by a 16-centimeter-thick layer of gravel between two and eight centimeters in diameter; the third layer was six centimeters thick and consisted of gravel (1.6 centimeters in diameter), sand, and bitumen. The binding agent was gravel (fragments of granite) and bitumen (three and a half liters per square meter).

3. The construction crew numbered about 100 and included a chief engineer, two technicians, a general supervisor, four foremen, a 40-man brigade performing earthwork operations, a five-man brigade in charge of installing conduits, plus a ten-man auxiliary brigade; the remaining 30-add workmen included mechanics, truck drivers and the operators of construction equipment such as scrapers, excavators, graders, etc. The machinery consisted of three scrapers, two excavators, two graders, three mechanical asphalt spreaders, three road rollers, a gravel spreader, and about 15 dump trucks of four and a half metric ton capacity. Maintenance and repair of the highway was in charge of Road Maintenance Section No. 5 (Dorozhnyy Eksploatacionnyy Uchastok — DEU — No. 5); one road laborer was responsible for a three-kilometer-long stretch of road.
4. The following monthly wages were paid to construction personnel: the chief engineer, general supervisor, technicians and foremen received 1,800, 1,200, 1,100 and 800 rubles, respectively, besides production bonuses; the seventh, sixth, fifth, fourth, and third category workers received 1,200, 900, 875, 750, and 700 rubles respectively; vehicle drivers were paid according to the number of hours they worked and received bonuses for maintaining the machinery in good repair and for saving fuel and spare parts.

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